

Claims:

We claim:

1           1.       A surgical instrument for urging a longitudinal spinal member into a top-  
2 loading spinal implant, the instrument comprising:  
3           a holder assembly;  
4           a release assembly; and  
5           an actuating member operatively associated with the holder assembly and the release  
6 assembly so that actuation of the actuating member moves the holder assembly with respect  
7 to the release assembly;  
8           wherein the release assembly comprises a tubular member and a pusher member, the  
9 tubular member is sized and configured to be slidably disposed within the holder assembly,  
10 and the pusher member is sized and configured to slidably surround at least a portion of the  
11 holder assembly.

1           2.       The instrument of claim 1, wherein the holder assembly includes a proximal  
2 end and a distal end, the distal end including a pair of fingers for engaging the spinal implant,  
3 and the pusher member includes a recess for engaging the longitudinal spinal member so that  
4 movement of the holder assembly with respect to the release assembly urges the spinal  
5 member into engagement with the spinal implant.

1           3.       The instrument of claim 2, the fingers having a first position in which the  
2 spinal implant is freely received therebetween, and a second position in which the fingers  
3 contact an underside of an edge of the spinal implant to retain the implant in at least a first  
4 axial direction, wherein the fingers are adjustably moveable from the first position to the  
5 second position.

1           4.       The instrument of claim 2, wherein the distal end of the holder assembly  
2 further includes a pair of U-shaped recesses configured to correspond with the recess formed  
3 in the pusher member so that the spinal rod may extend completely through the holder  
4 assembly and the pusher member.

1           5.       The instrument of claim 2, wherein the actuating member is moveable  
2 between a rest position and an actuated position, the fingers being biased apart in the rest  
3 position and are sized and configured to contact an underside of an edge of the spinal implant  
4 in the actuated position.

1           6.       The instrument of claim 2, wherein the pusher member has an interior surface  
2 and the fingers have an exterior surface configured to engage the interior surface of the  
3 pusher member so that movement of the holder assembly with respect to the release assembly  
4 moves the fingers from a first position in which the fingers are separated by a first separation  
5 distance to a second position in which the fingers are separated by a second separation  
6 distance, the second separation distance being less than the first separation distance.

1           7.       The instrument of claim 6, wherein the fingers are sized and configured so that  
2 when in the second position, the fingers engage an underside of an edge of the spinal implant.

1           8.       The instrument of claim 1, wherein the distal end of the tubular member  
2 includes at least one hole and the pusher member includes at least one aperture, the at least  
3 one hole and the at least one aperture being sized and configured to receive at least one pin  
4 for securing the pusher member to the tubular member.

1           9.       The instrument of claim 1, wherein the pusher member includes a proximal  
2 section and a distal section disposed along a longitudinal axis of the pusher member, the  
3 member having an opening sized and configured to receive the holder assembly coaxially  
4 therein.

1           10.     The instrument of claim 1, wherein the tubular member further includes a  
2 central bore extending from a proximal end to a distal end of the member, the central bore  
3 being sized and configured to receive a fastener.

1           11.     The instrument of claim 1, wherein the proximal end of the holder assembly  
2 includes at least one slot sized and configured to receive a portion of the actuating member.

1           12.     The instrument of claim 11, wherein the tubular member further includes a  
2 proximal end and a distal end, the proximal end of the tubular member including a first pair  
3 of slots sized and configured to receive a portion of the actuating member.

1           13.     The instrument of claim 12, wherein the proximal end of the tubular member  
2 further includes a second pair of slots sized and configured to correspond with the slots  
3 formed on the holder assembly when the release assembly is inserted into the holder  
4 assembly.

1           14.     The instrument of claim 12, wherein the actuating member further includes a  
2 first tip and a second tip each sized and configured to snap onto and engage the slots formed  
3 in the holder and release assemblies, respectively.

1           15.     The instrument of claim 1, wherein the tubular member includes a proximal  
2 end and a distal end, the proximal end of the tubular member includes a slot sized and  
3 configured to mate with a pin in the proximal end of the holder assembly to facilitate proper  
4 alignment of the tubular member within the holder assembly.

1           16.     The instrument of claim 1, wherein the actuating member is a hand grip, the  
2     hand grip having a first grip member, a second grip member, a first jaw member, and a  
3     second jaw member, the first grip member pivotally coupled to the second grip member, and  
4     the first and second jaw members are operatively associated with the holder and release  
5     assemblies, respectively.

1           17.     The instrument of claim 16, wherein the first grip member is pivotally coupled  
2     to the first jaw member and the second grip member is pivotally coupled to the second jaw  
3     member.

1           18.     The instrument of claim 17, wherein the first grip member further includes a  
2     pin slidably movable in a slot formed in the second jaw member and the second grip member  
3     includes a pin slidably movable in a slot formed in the first jaw member to maintain the jaw  
4     members in parallel alignment when the instrument is actuated.

1           19.     The instrument of claim 18, wherein the first and second jaw members further  
2     include a tip sized and configured to snap onto and engage corresponding slots formed in the  
3     holder and release assemblies.

1           20.     The instrument of claim 19, wherein when the hand grip snaps onto the holder  
2     and release assemblies, the hand grip is orientated substantially perpendicular to the  
3     longitudinal axes of the holder and release assemblies.

1           21.     The instrument of claim 1, wherein the longitudinal spinal member is a  
2 longitudinal spinal rod and the spinal implant comprises:  
3           a body having a channel for receiving the spinal rod;  
4           an anchor member associated with the body, and  
5           a fastener for securing the spinal rod to the body and for fixing the angular position of  
6 the anchor member with respect to the body.

1           22.     The instrument of claim 21, wherein the body is a generally cylindrical  
2 member having an upper portion incorporating the channel, and a lower portion defining a  
3 recess, the anchor member further including a curvate head that is shaped and dimensioned to  
4 fit within the recess for facilitating polyaxial movement of the body with respect to the  
5 anchor member.

1           23.     The instrument of claim 22, wherein the lower portion of the body  
2 surrounding the recess is at least partially compressible to allow the body to be snapped over  
3 the curvate head.

1           24.     The instrument of claim 23, wherein the spinal implant further includes a  
2 collar slidably disposed around the lower portion of the body, the collar having an inner  
3 surface that interacts with an exterior surface of the lower portion of the body to compress the  
4 recess around the curvate head when the collar is pressed downward with respect to the body.

1           25.     The instrument of claim 24, wherein the fastener is a set screw sized and  
2     configured to engage internal threads formed on an inside surface of the upper portion of the  
3     body member such that tightening the fastener onto the body moves the fastener against the  
4     spinal rod when the rod is located in the channel and urges the spinal rod against the collar  
5     causing the collar to move downward along the exterior surface of the lower portion of the  
6     body thereby contracting the recess around the curvate head of the anchor member, locking  
7     the angular position of the anchor member with respect to the body.

1           26.     The instrument of claim 25, wherein the holder assembly includes a pair of  
2     fingers at a distal end thereof, the fingers being sized and configured to allow an axial upward  
3     force to be applied to the locking collar.

1           27.     A surgical instrument for urging a longitudinal spinal member into a top-  
2     loading spinal implant, the instrument comprising:  
3             a holder assembly having a pair of fingers each including an inward pointing ledge  
4     which project radially inwards from an end of the respective finger, the ledge being sized and  
5     configured to contact an underside of an edge of the spinal implant;  
6             a release assembly; and  
7             an actuating member wherein the actuating member engages a portion of the holder  
8     assembly and a portion of the release assembly so that actuation of the actuating member  
9     moves the holder assembly with respect to the release assembly and compresses the fingers  
10    from a first position to a second position so that fingers contact the underside of the edge of  
11    the spinal implant.

1           28.     The instrument of claim 27, wherein the release assembly includes a recess for  
2     engaging the longitudinal spinal member so that movement of the holder assembly with  
3     respect to the release assembly urges the spinal member into engagement with the spinal  
4     implant.

1           29.     The instrument of claim 28, wherein the holder assembly further includes a  
2     pair of U-shaped recesses configured to correspond with the recess formed in the release  
3     assembly so that the spinal rod may extend completely through the holder assembly and the  
4     release assembly.

1           30.     The instrument of claim 28, wherein the release assembly comprises a tubular  
2     member and a pusher member, the tubular member being sized and configured to be slidably  
3     disposed within the holder assembly, and the pusher member being sized and configured to  
4     slidably surround at least a portion of the fingers.

1           31.     The instrument of claim 30, wherein the pusher member has an interior  
2     surface and the fingers have an exterior surface configured to engage the interior surface of  
3     the pusher member so that movement of the holder assembly with respect to the release  
4     assembly compresses the fingers from a first separation distance when in the first position to  
5     a second separation distance when in the second position, the second separation distance  
6     being less than the first separation distance.

1           32.     The instrument of claim 30, wherein the pusher member includes a proximal  
2     section and a distal section disposed along a longitudinal axis of the pusher member, the  
3     member having an opening sized and configured to receive the holder assembly coaxially  
4     therein.

1           33.     The instrument of claim 30, wherein the distal end of the tubular member  
2 includes at least one hole and the pusher member includes at least one aperture, the at least  
3 one hole and the at least one aperture being sized and configured to receive at least one pin  
4 for securing the pusher member to the tubular member.

1           34.     The instrument of claim 27, wherein the release assembly further includes a  
2 central bore extending from a proximal end to a distal end of the member, the central bore  
3 being sized and configured to receive a fastener.

1           35.     The instrument of claim 27, wherein the proximal end of the holder assembly  
2 includes at least one slot sized and configured to receive a portion of the actuating member.

1           36.     The instrument of claim 35, wherein the release assembly further includes a  
2 proximal end having a first pair of slots sized and configured to receive a portion of the  
3 actuating member.

1           37.     The instrument of claim 36, wherein the proximal end of the release assembly  
2 further includes a second pair of slots sized and configured to correspond with the slots  
3 formed on the holder assembly when the release assembly is inserted into the holder  
4 assembly.

1           38.     The instrument of claim 36, wherein the actuating assembly further includes a  
2 first tip and a second tip each sized and configured to snap onto and engage the slots formed  
3 in the holder and release assemblies, respectively.

1           39.     The instrument of claim 27, wherein the release assembly includes a proximal  
2 end having a slot sized and configured to mate with a pin in the proximal end of the holder  
3 assembly to facilitate proper alignment of the release assembly within the holder assembly.



1           40.     The instrument of claim 27, wherein the actuating member is a hand grip, the  
2 hand grip having a first grip member, a second grip member, a first jaw member, and a  
3 second jaw member, the first grip member pivotally coupled to the second grip member, and  
4 the first and second jaw members are operatively associated with the holder and release  
5 assemblies, respectively.

1           41.     The instrument of claim 40, wherein the first grip member is pivotally coupled  
2 to the first jaw member and the second grip member is pivotally coupled to the second jaw  
3 member.

1           42.     The instrument of claim 41, wherein the first grip member further includes a  
2 pin slidably movable in a slot formed in the second jaw member and the second grip member  
3 includes a pin slidably movable in a slot formed in the first jaw member to maintain the jaw  
4 members in parallel alignment when the instrument is actuated.

1           43.     The instrument of claim 42, wherein the first and second jaw members further  
2 include a tip sized and configured to snap onto and engage corresponding slots formed in the  
3 holder and release assemblies.

1           44.     The instrument of claim 43, wherein when the hand grip snaps onto the holder  
2 assembly and the release assembly, the hand grip is orientated substantially perpendicular to  
3 the longitudinal axes of the holder and release assemblies.

1           45.     The instrument of claim 27, wherein the longitudinal spinal member is a  
2 longitudinal spinal rod and the spinal implant comprises:  
3           a body having a channel for receiving the spinal rod;  
4           an anchor member associated with the body, and  
5           a fastener for securing the spinal rod to the body and for fixing the angular position of  
6 the anchor member with respect to the body.

1           46.     The instrument of claim 45, wherein the body is a generally cylindrical  
2 member having an upper portion incorporating the channel, and a lower portion defining a  
3 recess, the anchor member further including a curvate head that is shaped and dimensioned to  
4 fit within the recess for facilitating polyaxial movement of the body with respect to the  
5 anchor member.

1           47.     The instrument of claim 46, wherein the lower portion of the body  
2 surrounding the recess is at least partially compressible to allow the body to be snapped over  
3 the curvate head.

1           48.     The instrument of claim 47, wherein the spinal implant further includes a  
2 collar slidably disposed around the lower portion of the body, the collar having an inner  
3 surface that interacts with an exterior surface of the lower portion of the body to compress the  
4 recess around the curvate head when the collar is pressed downward with respect to the body.

1           49.     The instrument of claim 48, wherein the fastener is a set screw sized and  
2     configured to engage internal threads formed on an inside surface of the upper portion of the  
3     body member such that tightening the fastener onto the body moves the fastener against the  
4     spinal rod when the rod is located in the channel and urges the spinal rod against the collar  
5     causing the collar to move downward along the exterior surface of the lower portion of the  
6     body thereby contracting the recess around the curvate head of the anchor member, locking  
7     the angular position of the anchor member with respect to the body.

1           50.     The instrument of claim 49, wherein the fingers are sized and configured to  
2     allow an axial upward force to be applied to the locking collar.

1           51.     A surgical instrument for urging a longitudinal spinal member into a top-  
2     loading spinal implant, the instrument comprising:  
3             a holder assembly having a proximal end and a distal end;  
4             a release assembly having a proximal end and a distal end; and  
5             a hand grip having a first tip and a second tip sized and configured to snap onto and  
6     engage the proximal end of the holder and release assemblies, respectively, so that actuation  
7     of the hand grip moves the holder assembly with respect to the release assembly.

1           52.     The instrument of claim 51, wherein the proximal end of the holder assembly  
2     includes at least one slot sized and configured to receive a portion of the hand grip.

1           53.     The instrument of claim 52, wherein the proximal end of the release assembly  
2     further includes a first pair of slots sized and configured to receive a portion of the hand grip.

1           54.     The instrument of claim 53, wherein the proximal end of the release assembly  
2 further includes a second pair of slots sized and configured to correspond with the slots  
3 formed on the holder assembly when the release assembly is inserted into the holder  
4 assembly.

1           55.     The instrument of claim 51, wherein the release assembly comprises a tubular  
2 member and a pusher member, the tubular member is sized and configured to be slidably  
3 disposed within the holder assembly, and the pusher member is sized and configured to  
4 slidably surround at least a portion of the holder assembly.

1           56.     The instrument of claim 55, wherein the distal end of the tubular member  
2 includes at least one hole and the pusher member includes at least one aperture, the at least  
3 one hole and the at least one aperture being sized and configured to receive at least one pin  
4 for securing the pusher member to the tubular member.

1           57.     The instrument of claim 55, wherein the pusher member includes a proximal  
2 section and a distal section disposed along a longitudinal axis of the pusher member, the  
3 member having an opening sized and configured to receive the holder assembly coaxially  
4 therein.

1           58.     The instrument of claim 51, wherein the distal end of the holder assembly  
2 further includes a pair of U-shaped recesses configured to correspond with at least one recess  
3 formed in the release assembly so that the spinal rod may extend completely through the  
4 holder assembly and the release assembly.

1           59.     The instrument of claim 51, wherein the distal end of the holder assembly  
2 includes a pair of fingers for engaging the spinal implant, and the distal end of the release  
3 assembly includes a recess for engaging the longitudinal spinal member so that movement of  
4 the holder assembly with respect to the release assembly urges the spinal member into  
5 engagement with the spinal implant.

1           60.     The instrument of claim 59, wherein the fingers have a first position in which  
2 the spinal implant is freely received therebetween, and a second position in which the fingers  
3 contact an underside of an edge of the spinal implant to retain the implant in at least a first  
4 axial direction, wherein the fingers are adjustably moveable from the first position to the  
5 second position.

1           61.     The instrument of claim 59, wherein the hand grip is moveable between a rest  
2 position and an actuated position, the fingers being biased apart in the rest position and are  
3 sized and configured to contact an underside of an edge of the spinal implant in the actuated  
4 position.

1           62.     The instrument of claim 59, wherein the release assembly has an interior  
2 surface and the fingers have an exterior surface configured to engage the interior surface of  
3 the release assembly so that movement of the holder assembly with respect to the release  
4 assembly moves the fingers from a first position in which the fingers are separated by a first  
5 separation distance to a second position in which the fingers are separated by a second  
6 separation distance, the second separation distance being less than the first separation  
7 distance.

1           63.     The instrument of claim 62, wherein the fingers are sized and configured so  
2 that when in the second position, the fingers engage an underside of an edge of the spinal  
3 implant.

1           64.     The instrument of claim 51, wherein the release assembly further includes a  
2     central bore extending from the proximal end to the distal end of the assembly, the central  
3     bore being sized and configured to receive a fastener.

1           65.     The instrument of claim 51, wherein the proximal end of the release assembly  
2     includes a slot sized and configured to mate with a pin in the proximal end of the holder  
3     assembly to facilitate proper alignment of the release assembly within the holder assembly.

1           66.     The instrument of claim 51, wherein the hand grip includes a first grip  
2     member, a second grip member, a first jaw member, and a second jaw member, the first grip  
3     member pivotally coupled to the second grip member, and the first and second jaw members  
4     are operatively associated with the holder and release assemblies, respectively.

1           67.     The instrument of claim 66, wherein the first grip member is pivotally coupled  
2     to the first jaw member and the second grip member is pivotally coupled to the second jaw  
3     member.

1           68.     The instrument of claim 67, wherein the first grip member further includes a  
2     pin slidably movable in a slot formed in the second jaw member and the second grip member  
3     includes a pin slidably movable in a slot formed in the first jaw member to maintain the jaw  
4     members in parallel alignment when the instrument is actuated.

1           69.     The instrument of claim 68, wherein the first and second jaw members further  
2     include a tip sized and configured to snap onto and engage corresponding slots formed in the  
3     holder and release assemblies.

1           70.     The instrument of claim 69, wherein when the hand grip snaps onto the holder  
2     and release assemblies, the hand grip is orientated substantially perpendicular to the  
3     longitudinal axes of the holder and release assemblies.

1           71.     The instrument of claim 51, wherein the longitudinal spinal member is a  
2 longitudinal spinal rod and the spinal implant comprises:  
3           a body having a channel for receiving the spinal rod;  
4           an anchor member associated with the body, and  
5           a fastener for securing the spinal rod to the body and for fixing the angular position of  
6 the anchor member with respect to the body.

1           72.     The instrument of claim 71, wherein the body is a generally cylindrical  
2 member having an upper portion incorporating the channel, and a lower portion defining a  
3 recess, the anchor member further including a curvate head that is shaped and dimensioned to  
4 fit within the recess for facilitating polyaxial movement of the body with respect to the  
5 anchor member.

1           73.     The instrument of claim 72, wherein the lower portion of the body  
2 surrounding the recess is at least partially compressible to allow the body to be snapped over  
3 the curvate head.

1           74.     The instrument of claim 73, wherein the spinal implant further includes a  
2 collar slidably disposed around the lower portion of the body, the collar having an inner  
3 surface that interacts with an exterior surface of the lower portion of the body to compress the  
4 recess around the curvate head when the collar is pressed downward with respect to the body.

1           75.     The instrument of claim 74, wherein the fastener is a set screw sized and  
2 configured to engage internal threads formed on an inside surface of the upper portion of the  
3 body member such that tightening the fastener onto the body moves the fastener against the  
4 spinal rod when the rod is located in the channel and urges the spinal rod against the collar  
5 causing the collar to move downward along the exterior surface of the lower portion of the  
6 body thereby contracting the recess around the curvate head of the anchor member, locking  
7 the angular position of the anchor member with respect to the body.

1           76.     The instrument of claim 75, wherein the holder assembly includes a pair of  
2 fingers at a distal end thereof, the fingers being sized and configured to allow an axial upward  
3 force to be applied to the locking collar.